

Submission Title: [P1451.5-ZigBee discussion for Sensors Expo, 07 June 2004]

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Re: [P1451.5-ZigBee]

Abstract: [Progress in defining ZigBee con]

Purpose: [Provide a framework for Interfacing P1451.5-ZigBee to P1451.0]

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IEEE P1451.5-ZigBee

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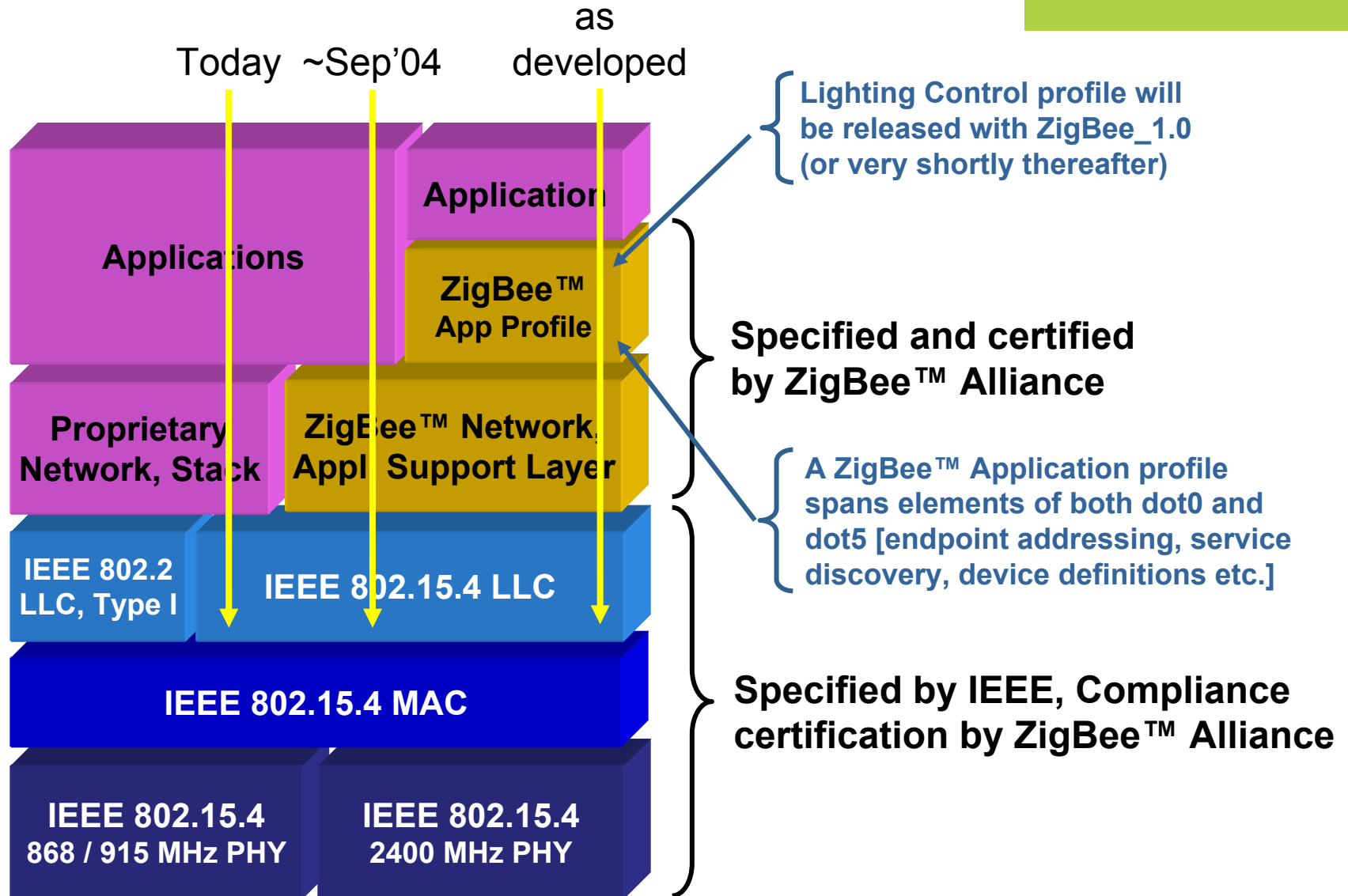


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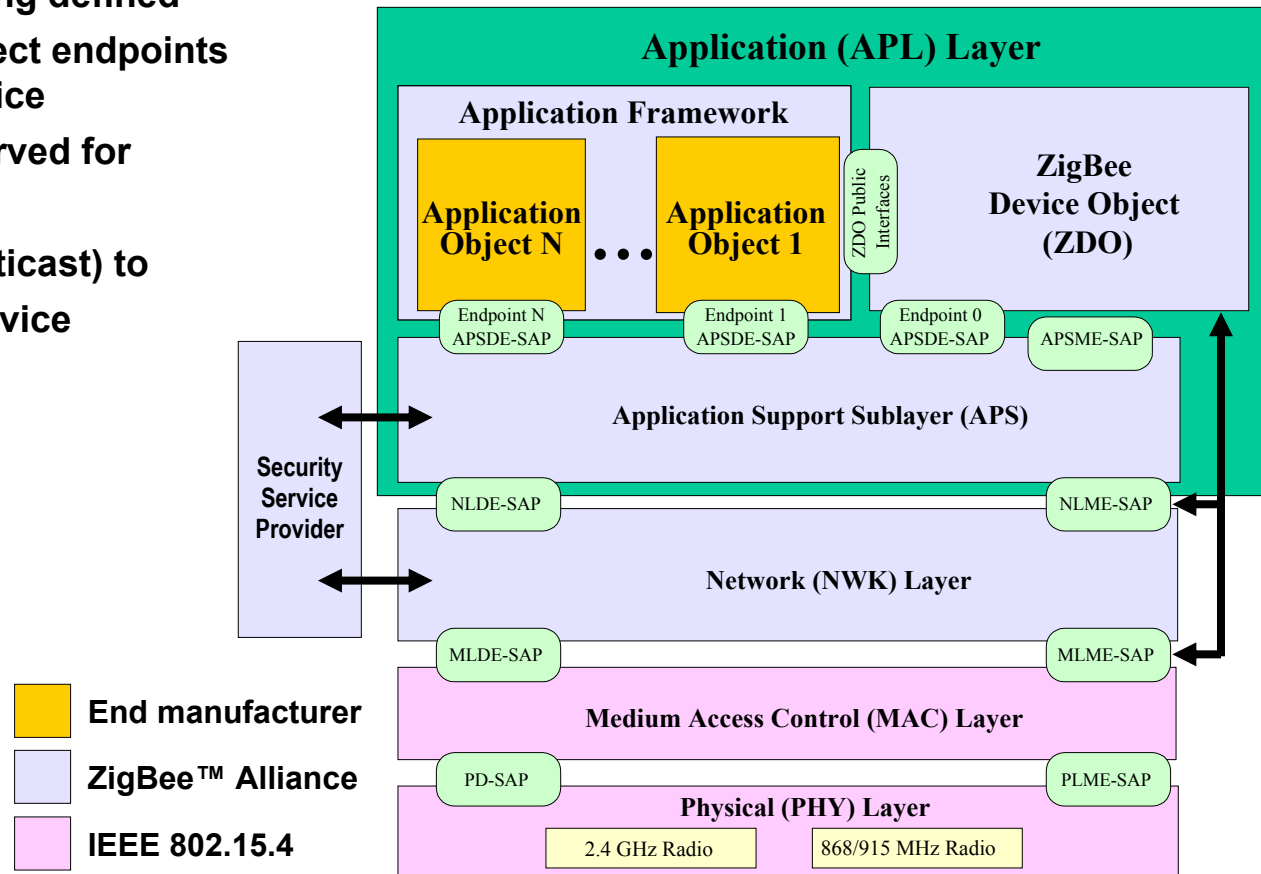
ZigBee™ Protocol Stack Review



(Developing) ZigBee™ Stack Detail

Endpoint Addressing

- Addressing methods are being defined
- 8 bit field for application object endpoints (and interfaces) on each device
- Some endpoints will be reserved for
 - Device management
 - Broadcast (possibly multicast) to endpoints on a single device



ZigBee™ Devices assume Client-Server topology (only)

- IEEE 802.15.4 air interface supports only UNICAST & BROADCAST packets
Broadcast mainly used for route discovery requests for “mesh” routing
- Client issues requests, receives responses
- Server receives requests, issues responses
- Roles are non-exclusive (e.g., any device can assume either role)

2 Message Service Types

Key Value Pair (KVP)

- GET, SET and EVENT
- GET_RESPONSE, SET_RESPONSE and EVENT_RESPONSE
- can be used to implement Reads, Writes & Triggers

Message (MSG)

- Makes no assumptions about the content of the data frame
- Allows transport of non-KVP command & response protocol sets

ZigBee™ will provide methods for Automatic Service Discovery

- **ZigBee methods will be compatible with TEDS taxonomies**
- **TEDS provides a general description, may allow less “re-invention” of device definitions in various profiles**

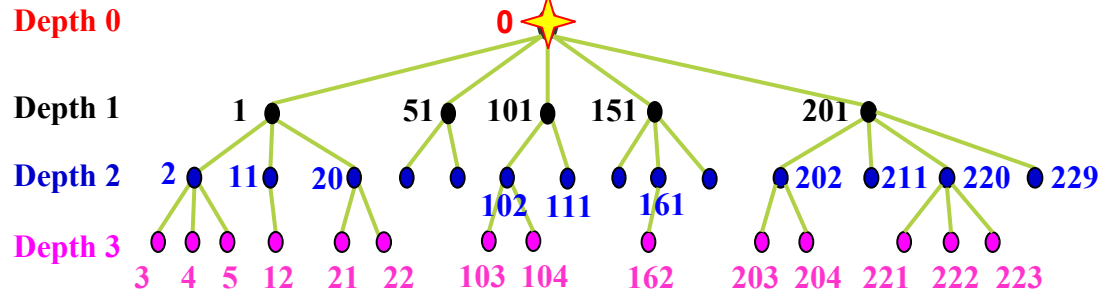
ZigBee is all about TIM-to-TIM communication

- **Messages do not have to flow through an NCAP (but can)**
- **Has many benefits - reduces latency, traffic & bottlenecking, etc.**
- **Registry of endpoint services & binding information**

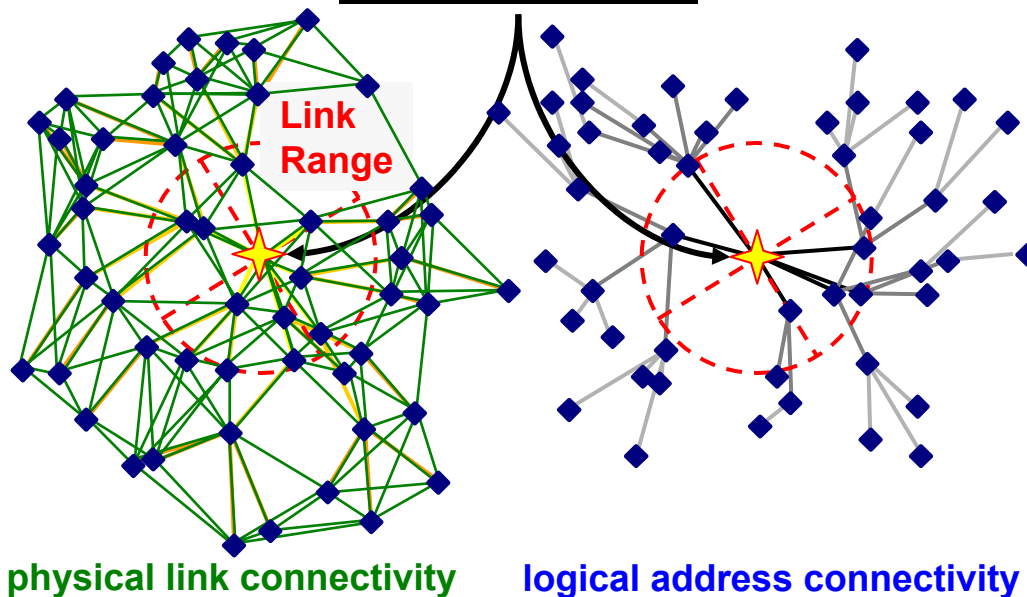
Dot0 should not try to supply methods, only provide us with the flexibility (esp. with respect to TIM-to-TIM)

ZigBee Ad-hoc Network Formation

PAN Coordinator



WPAN Coordinators



Preliminary

- Coordinators set parameters defining their network's structure:
- New devices (nodes) request to associate to a prospective router
- Logical (16 bit) addresses are assigned to new devices locally using the shared parameters set by the coordinator
- All devices can send directly to other devices within range
- Routing-capable devices can forward messages along logical address structure OR discover and use an optimum route

Envisioned 802.15.4-ZigBee PHY TEDS



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802.15.4-ZigBee MAC attributes

ZBmacAckWaitDuration
ZBmacAssociationPermit
ZBmacBattLifeExt
ZBmacBeaconOrder
ZBmacBeaconTxTime
ZBmacGTSPermit
ZBmacMaxCSMABackoffs
ZBmacMinBE
ZBmacRxOnWhenIdle
ZBmacSuperframeOrder

802.15.4 MAC PIB	ID#
macAckWaitDuration	0x40
macAssociationPermit	0x41
macAutoRequest	0x42
macBattLifeExt	0x43
macBattLifeExtPeriod	0x44
macBeaconPayload	0x45
macBeaconPayloadLength	0x46
macBeaconOrder	0x47
macBeaconTxTime	0x48
macBSN	0x49
macCoordExtendedAddress	0x4a
macCoordShortAddress	0x4b
macDSN	0x4c
macGTSPermit	0x4d
macMaxCSMABackoffs	0x4e
macMinBE	0x4f
macPANId	0x50
macPromiscuousMode	0x51
macRxOnWhenIdle	0x52
macShortAddress	0x53
macSuperframeOrder	0x54
macTransactionPersistenceTime	0x55

Selected fields = 10 bytes
All fields ≤ 82 bytes
(assuming compacted
booleans)

802.15.4-ZigBee PHY attributes

ZBphyChannelsSupported
ZBphyTransmitPower
ZBphyCCAMode

802.15.4 PHY PIB	ID#
phyCurrentChannel	0x00
phyChannelsSupported	0x01
phyTransmitPower	0x02
phyCCAMode	0x03

Selected fields = 7 bytes
All fields = 8 bytes



